

CLAIMS

1. A method for characterizing a ferroelectric material, comprising:

- 5 - applying an electrical voltage to a sample of this ferroelectric material;
- simultaneously measuring the small-signal capacitance of the sample ;
- measuring the electrical current flowing
- 10 through this sample; and
- jointly processing an applied voltage signal, a measured current signal and a small-signal capacitance signal, so as to provide representative data characterizing the polarization of the ferroelectric
- 15 material,
- characterized in that it furthermore includes:
- feedback controlling the applied electrical voltage so as to superpose a first current component with what is called a "large-signal" first amplitude at
- 20 a first frequency, and having plateaus at the ends, on a second current component with what is called a "small-signal" second amplitude at a second frequency very much higher than the first frequency; and
- identifying characteristics of the
- 25 ferroelectric material that are associated with locally reversible polarization effects and with locally irreversible polarization effects, respectively.

2. A device for characterizing ferroelectric

30 materials, implementing the method according to the invention, comprising:

- means for applying an AC voltage to a sample of the ferroelectric material;
- means for measuring the electrical current
- 35 flowing through this sample;
- means for measuring the small-signal capacitance of this sample ;
- means for jointly processing an applied voltage

signal, a measured current signal and a small-signal capacitance signal, means for providing representative data for characterizing the polarization of the ferroelectric material,

5 characterized in that it furthermore includes:

- means for feedback controlling the applied electrical voltage so as to superpose a first current component with what is called a "large-signal" first amplitude at a first frequency, and having plateaus at
10 the ends, on a second current component with what is called a "small-signal" second amplitude at a second frequency very much higher than the first frequency; and

- means for extracting the characteristics of the
15 ferroelectric material that are associated with locally reversible polarization effects and with locally irreversible polarization effects, respectively, from the processing data.

20 3. The device according to Claim 2, wherein the voltage feedback control means comprise a transconductance operational amplifier.